ELSEVIER

Journal of Materials Processing Technology 80–81 (1998) 713–714

Journal of Materials Processing Technology

Author Index of Volumes 80–81

Adamidis, P., 330
Adams, B.L., 315
Aguilar, M.T.P., 376
Alart, P., 257
Altintas, S., 83
Appleton, E., 501
Author, A., 723
Avery, I., 565

Bae, W.B., 161, 653
Balendra, R., 144, 665
Ball, A.A., 613
Bandar, A.R., 657
Barlat, F., 433
Bay, F., 8
Bay, N., 292
Bayraktar, E., 83
Beck, A., 330
Becker-Lemgau, U., 330
Behrens, A., 298
Bellenger, E., 591
Beltrando, L., 188
Berstad, T., 551
Biba, N., 184
Brooks, J.W., 149
Brunet, M., 40, 213
Burdek, M., 398
Bussy, P., 591
Button, S.T., 131, 642

Campos, H.B., 388
Canta, T., 195
Caporalli, Â., 131
Cardew-Hall, C.-H., 68
Cardew-Hall, M.J., 1, 251
Cetlin, P.R., 376, 388
Chang, S.-C., 676
Chang, Y., 676
Chan, L.C., 126
Chen, J.-S., 642
Chenot, J.-L., 8
Cheung, W.M., 126
Choi, H.-H., 113
Choi, J.C., 450, 487
Choi, S.S., 161
Cho, J.R., 161, 653, 671
Chung, H.-C., 676
Chung, J.S., 136
Chung, K., 433
Corrêa, E.C.S., 376
Cser, L., 16

Davey, K., 206
Dean, T.A., 149
De Maré, C., 545
de Moura, A.C., 531
Ding, Y., 330
Dong, Y., 273
Dubar, L., 245
Dubois, A., 245
Duncan, J.L., 220
Dunne, F.P., 96
Dyja, H., 361, 481

Engel, U., 602
Estrems, M., 121
Estrin, Y., 33
Evans, P., 320

Falk, B., 602
Farrugia, D.C.J., 475, 690
Faura, F., 121
Ferran, G., 531
Forcellese, A., 108, 493, 507
Franzke, M., 330
Fratini, L., 108
Frunza, D., 195
Fujimoto, H., 513

Gabrielli, F., 108, 493
García, A., 121
Geiger, M., 602
Gelin, J.C., 24, 560, 597
Ghouati, O., 560, 597
Gileno, L.A., 131
Glaß, R., 174
Glowacki, M., 166
Gouveia, B.P.P.A., 647
Gunasekera, J.S., 392

Hagemann, F., 458
Hahn, F., 174
Hall, F.R., 565
Hampel, H., 315
Hanada, K., 695
Han, W.-C., 676
Harada, Y., 309
Hartley, P., 199
Hatano, H., 406
Hatta, N., 513
Hentschel, L., 458
Herron, J.C., 68
Hodgson, P.D., 1, 68, 251
Hoferlin, E., 545
Holthoff, H., 330
Hopperstad, O.S., 538, 551
Horský, J., 337
Hou, H.-Y., 676
Hsu, H.-H., 341
Huang, C.-A., 676
Huh, H., 76
Hu, Z.M., 149
Hwang, S.M., 136
Hwang, Y.-M., 341

Ikeda, S., 517
Ike, H., 101
Ilstad, H., 551
Ito, K., 406
Iwaki, N., 406

Janíček, L., 572
Jarvis, G., 315
Jean, M., 257
Jensrud, O., 156
Jeong, H.S., 671
Jeswiet, J., 239
Jimma, T., 406
Jourdan, F., 257

Kakita, T., 54
Kang, B.S., 444
Kang, B.-S., 113
Kang, C.G., 444
Karnezis, P., 690
Kartik, R., 392
Kasuga, Y., 406
Katayama, T., 635
Kawamoto, T., 345
Kawka, M., 54
Kim, B.M., 487
Kim, D.H., 487
Kim, D.K., 161
Kim, J.I., 444
Kim, K.S., 671
Kim, T.-W., 96
Kim, Y.H., 161, 653, 671
Kiselev, A.B., 585
Ko, D.C., 487
Kolbe, M., 174
Kopp, R., 458
Korczak, P., 361, 481
Korhonen, A.S., 16
Kotrbáček, P., 337
Kuroda, K., 517
Kusiak, J., 507, 683
Kuwabara, T., 517
Kuziak, R., 524
Kuzman, K., 413

Łabuda, E., 361, 481
Lademo, O.-G., 551

Elsevier Science S.A.
PII S0924-0136(98)00241-6

Lademo, O.G., 538
Lahoti, G.D., 392
Langseth, M., 551
Lanzon, J.M., 251
Lapkowski, W., 463
Lapovok, R., 365, 608
Larkiola, J., 16
Laux, M., 330
Lazzarotto, L., 245
Lee, B.M., 450
Lee, C.H., 76
Lee, P.S., 315
Lee, S.W., 60
Lee, T.C., 126
Lenard, J.G., 232
Levers, A., 304
Lim, T., 199
Lin, J., 613
Lishnij, A., 184
Lissington, T.R., 220
Liu, Y.L., 507
Li, Y.H., 282
Long, H., 665
Lorcharoensery, K., 657
Lovell, M., 273
Łuksza, J., 683
Luksza, J., 398

Mahmudi, R., 707
Majta, J., 166, 398, 524
Makinouchi, A., 54
Maki, S., 309
Malo, K.A., 538
Manabe, K., 421
Martins, P.A.F., 292, 647
Marumo, Y., 427
Matsuzawa, H., 345
Mehdizadeh, M., 707
Merrygold, E., 179
Meyer, L.W., 174
Mguil, S., 40, 213
Micari, F., 108
Miller, B.C., 206
Misiolek, W.Z., 657
Miyazawa, O., 406
Moreira, L.P., 531
Morestin, F., 40
Mori, E., 406
Mori, K., 438
Mori, K.-i., 309, 700
Moritoki, H., 579
Müller, A., 330
Münch, M., 330
Murakoshi, Y., 695
Myllykoski, P., 16

Nakamachi, E., 635
Nakamura, Y., 635
Navarro, S., 188
Negishi, H., 695
Nilsson, A., 325, 469

Ohata, T., 635
Okuyama, E., 579
Omori, N., 635
Ona, H., 225
Oñate, E., 620
Osakada, K., 438, 700
Osman, F.H., 179
Otsu, M., 438
Oudin, J., 245
Ou, H., 144

Paćko, M., 380, 683
Pan, C., 642
Panton, S.M., 220
Park, H.J., 450
Park, J.W., 653
Park, M.-S., 113
Patel, M., 475
Pater, Zb., 370
Paulson, M.S., 556
Pawelski, O., 287
Pedersen, K., 156
Pepelnjak, T., 413
Petruška, J., 572
Petty, D.M., 356
Picart, P., 597
Piehler, H.R., 315
Pietrzyk, M., 166, 524
Pillinger, I., 199
Plancak, M., 101
Pol, P., 213
Ponthot, J.-P., 628
Postek, E., 620
Pourboghrat, F., 433
Prior, A., 304

Rasp, W., 287
Raudenský, M., 337
Ravassard, P., 245
Reuter, A., 330
Rezende, J.L.L., 376
Rhaipu, S., 90
Roberts, S.M., 507
Rodrigues, J.M.C., 647
Rojek, J., 620
Rollett, A.D., 315
Roque, C.M.O.L., 642
Rosochowski, A., 188
Rudkins, N., 320
Ruffini, R., 493
Rumiński, M., 683
Ruminski, M., 398

Sabadus, D., 195
Saiki, H., 427
Saito, Y., 345, 351
Sano, T., 695
Sawamiphakdi, K., 392
Schafstall, H., 298
Schmitz, J.W., 458
Sellars, C.M., 282
Senk, D., 458
Shieh, T.-S., 676
Shimaya, F., 351
Shinkawa, M., 351
Shyu, G.-D., 676
Sinczak, J., 166
Skåre, T., 263
Skołyszewski, A., 380
Smirnov, S., 365
Solomein, V., 365
Ståhl, J.-E., 263
Steckel, B., 330
Steyaert, G., 545
Sturgess, C.E.N., 565
Summad, E., 501

Tagavi, K., 273
Takahashi, M., 695
Takuda, H., 513
Tan, X., 292
Thilderkvist, P., 263
Tilch, R., 330
Tintelecan, C., 195
Tourki, Z., 47
Trowsdale, A.J., 475
Tzou, G.Y., 341

Usherwood, T.W., 475
Utsunomiya, H., 345, 351

Valle, P.E., 376
Van Bael, A., 545
Van Houtte, P., 545
Vlasov, A., 184
Volod'ko, O.V., 585

Wadsworth, J.E.J., 475
Wang, C.-C., 676
Wang, W.-S., 676
Ward, M.J., 206
Watari, H., 225
Wen, J., 356
Wey, E., 149
Withers, P.J., 507
Wolff, C., 287
Wright, R.N., 556
Wu, B.J., 126

Yang, D.Y., 60, 433
Yang, M., 421
Yao, H.-T., 676
Yoon, J.W., 433
Yoon, S.S., 671
Yoshihara, S., 421
Yoshimura, H., 700
Yumashev, M.V., 585
Yu, S.-Y., 676

Zhang, W., 292
Zheng, J.J., 613

ELSEVIER

Journal of Materials Processing Technology 80–81 (1998) 715–725

Journal of Materials Processing Technology

Subject Index of Volumes 80–81

ABAQUS
dislocation theory based constitutive modelling: foundations and applications, 33
the effect of the rheological behaviour and the tribological parameter on sheet metal forming using a new model for orthotropic plasticity, 47
Acoustic emission
monitoring of friction processes by the means of acoustic emission measurements—deep drawing of sheet metal, 263
Adaptive control
artificial intelligence identification of process parameters and adaptive control system for deep-drawing process, 421
Adaptive friction
2D and 3D simulation of complex multistage forging processes by use of adaptive friction coefficient, 298
Aerofoil section
preform design for forging of aerofoil sections using FE simulation, 144
Air bending
effect of the training set size on springback control by neural network in an air bending process, 493
AlMgSi alloy
cold forging of high strength aluminum alloys and the development of new thermomechanical processing, 156
Aluminium
calibration of anisotropic yield criteria using uniaxial tension tests and bending tests, 538
Aluminium alloy
effect of the training set size on springback control by neural network in an air bending process, 493
Aluminium alloys
effects of the yield criterion on local deformations in numerical simulation of profile forming, 551
Aluminum
analytical and experimental studies of necking in sheet metal forming processes, 40
constitutive equation development for high strain deformation processing of aluminum alloys, 556
the effect of lubricant additives on the coefficient of friction in cold rolling, 232
2024 Aluminum alloy
tube spinnability of AA 2024 and 7075 aluminum alloys, 676
7075 Aluminum alloy
tube spinnability of AA 2024 and 7075 aluminum alloys, 676
Aluminum sheet
evaluation of the forming limit of aluminum square cups, 427
Aluminum tube
inside bead forming of aluminum tube by electro-magnetic forming, 695
Anisotropic sheet
artificial intelligence identification of process parameters and adaptive control system for deep-drawing process, 421
Anisotropy
calibration of anisotropic yield criteria using uniaxial tension tests and bending tests, 538
identification of material parameters directly from metal forming processes, 560
Anisotropy ratio
some problems in steel sheet forming processes, 83
Artificial neural network
artificial intelligence identification of process parameters and adaptive control system for deep-drawing process, 421
effect of the training set size on springback control by neural network in an air bending process, 493
methodology of preform design considering workability in metal forming by the artificial neural network and Taguchi method, 487
using neural network models for predicting mechanical properties after hot plate rolling processes, 481
Asymmetric upsetting test
analysis of the asymmetric upsetting test with extremely high strain rate as tool for friction measurement, 287

Backward forging
cold forging of high strength aluminum alloys and the development of new thermomechanical processing, 156
Bead forming
inside bead forming of aluminum tube by electro-magnetic forming, 695
Bearing-land width
an experimental study on the nonaxisymmetric square-die extrusion using model material test, 653
Bend
characteristic features of shape defects occurring in the cold roll forming of pre-notched products, 225
Bending
computer aided development of a bending–drawing test for thin metallic sheets, 531
the evaluation of springback in 3D stamping and coining processes, 108
Bending tests
calibration of anisotropic yield criteria using uniaxial tension tests and bending tests, 538
Biaxial tensile test
biaxial tests on cruciform specimens for the validation of crystallographic yield loci, 545
Biaxial tensile tests
measurement and analysis of differential work hardening in cold-rolled steel sheet under biaxial tension, 517
Blanking
finite element analysis of optimum clearance in the blanking process, 121
Boundary additives
the effect of lubricant additives on the coefficient of friction in cold rolling, 232

Elsevier Science S.A.
PII S0924-0136(98)00242-8

Brass sheets
surface roughening during uniaxial and equi-biaxial stretching of 70-30 brass sheets, 707
Bulk deformation
coining process as a means of controlling surface microgeometry, 101

Caliber rolling
satellite-mill rolling of U-shaped and H-shaped wires, 345
Calibration
calibration of anisotropic yield criteria using uniaxial tension tests and bending tests, 538
Camber
FE simulations of camber in hot strip rolling, 325
Chevron crack
prediction of central bursting in extrusion, 579
Cladding
lining of metal plates with foils using hot shot peening, 309
Closed die forging
coining process as a means of controlling surface microgeometry, 101
Closed pass
satellite-mill rolling of U-shaped and H-shaped wires, 345
Coagulation
some studies regarding thixoforming of metal alloys, 463
Coated steels
characterising frictional behaviour in sheet metal forming, 251
Cogging
analysis of the cogging process for heavy ingots by finite element method and physical modelling method, 161
Coining
coining process as a means of controlling surface microgeometry, 101
the evaluation of springback in 3D stamping and coining processes, 108
Coining process
design of a piercing hole in coining process by the three-dimensional backward tracing scheme of the FEM, 113
Cold draw process
development of utility programs for a cold drawing process, 392
Cold forging
estimation of tool life in bulk metal forming based on different failure concepts, 602
Cold forming
evaluation of elasticity and temperature effects on the dimensional accuracy of back-extruded components using finite element simulation, 665
three selection criteria for the cold metal forming lubricating oils containing extreme pressure agents, 245
Cold forward extrusion
finite element modelling of cold forward extrusion using updated Lagrangian and combined Eulerian–Lagrangian formulations, 647
Cold-rolled steel sheet
measurement and analysis of differential work hardening in cold-rolled steel sheet under biaxial tension, 517
Cold roll forming
characteristic features of shape defects occurring in the cold roll forming of pre-notched products, 225
Cold rolling
the effect of lubricant additives on the coefficient of friction in cold rolling, 232
the role of neural networks in the optimisation of rolling processes, 16
Collaboration
process and product integration: research challenges, 1

Component accuracy
evaluation of elasticity and temperature effects on the dimensional accuracy of back-extruded components using finite element simulation, 665
Compression holding time
finite element analysis of compression holding step in semi-solid forging and experimental confirmation, 450
Compression test
computationally-experimental workability determination of compressed cylindrical specimen with surface defect, 572
Compression testing
cold forging of high strength aluminum alloys and the development of new thermomechanical processing, 156
Computational modelling
modelling of damage in metal forming processes, 24
Computer aided design
modelling of a roll-forming process with a combined 2D and 3D FEM code, 213
Computer-aided engineering
steel strip production—a pilot application for coupled simulation with several calculation systems, 330
Computer simulation
modelling and measurements of mechanical behaviour in multi-pass drawing process, 398
modelling of the influence of thermomechanical processing of Nb-microalloyed steel on the resulting mechanical properties, 524
CONFORM
a study on optimal design for CONFORM process, 671
Constitutive equations
constitutive equation development for high strain deformation processing of aluminum alloys, 556
dislocation theory based constitutive modelling: foundations and applications, 33
three-dimensional finite element modelling of a titanium aluminide aerofoil forging, 149
Constitutive model
the effect of the rheological behaviour and the tribological parameter on sheet metal forming using a new model for orthotropic plasticity, 47
Contact
an alternative method between implicit and explicit schemes devoted to frictional contact problems in deep drawing simulation, 257
Contours of plastic work
measurement and analysis of differential work hardening in cold-rolled steel sheet under biaxial tension, 517
Conventional flat die
analysis of the cogging process for heavy ingots by finite element method and physical modelling method, 161
Cooling
experimental study of long product cooling in hot rolling, 337
Correlation technique
analytical and experimental studies of necking in sheet metal forming processes, 40
Coupled problem
simulation of coupled problem of electric upsetting, 184
Coupled simulation
steel strip production—a pilot application for coupled simulation with several calculation systems, 330
Crack propagation
fractal modelling of materials, 565
Critical back tension
back tension value in the fine wire drawing process, 380
Critical strain
some problems in steel sheet forming processes, 83

Cropping
experimental study on the shearing behaviour of fine-blanking versus bar cropping, 126
Cross rolling
processes of partial bulk metal-forming—aspects of technology and FEM simulation, 174
Cross-wedge rolling
analysis of interfacial slip in cross-wedge rolling: an experimentally verified finite-element model, 273
Cross wedge rolling
a study of cross wedge rolling process, 370
Cruciform specimen
measurement and analysis of differential work hardening in cold-rolled steel sheet under biaxial tension, 517
Crystallographic texture
biaxial tests on cruciform specimens for the validation of crystallographic yield loci, 545
Curve matching
generic algorithm for sheet metal working tool selection, using curve matching and tree searching, 501
Cyclic torsion
influence of strain path in the mechanical properties of drawn aluminum alloy bars, 376

Damage
improvement of die life by minimisation of damage accumulation and optimisation of preform design, 608
modelling of damage in metal forming processes, 24
optimization of metal forming process parameters with damage minimization, 597
plastic and viscoplastic damage models with numerical treatment for metal forming processes, 591
prediction of damage evolution in forged aluminium metal matrix composites using a neural network approach, 507
Damage model
analytical and experimental studies of necking in sheet metal forming processes, 40
Damage parameters
deforming and fracture of metals. The model of damageable thermoelastoviscoplastic medium, 585
Darcy's law
an investigation of the mushy state forging process by the finite element method, 444
Dead metal zone
three-dimensional material flow analysis of asymmetric hollow extrusions, 657
Deep-drawability
evaluation of the forming limit of aluminum square cups, 427
Deep drawing
an alternative method between implicit and explicit schemes devoted to frictional contact problems in deep drawing simulation, 257
an application of ultrasonic vibration to the deep drawing process, 406
Deep-drawing
artificial intelligence identification of process parameters and adaptive control system for deep-drawing process, 421
Defection
a study on optimal design for CONFORM process, 671
Deformation heating
some problems in steel sheet forming processes, 83
Deformation zone geometry
three-dimensional material flow analysis of asymmetric hollow extrusions, 657
Delaunay triangulation
inclusion of pressure of liquid phase in three-dimensional distinct element simulation of mushy-state forming, 438
Dendritic
an investigation of the mushy state forging process by the finite element method, 444
Design of grooves
changes of pass geometry of the system of oval and vertical oval stretching passes in the rolling process, 361
Die design
expert system for hot forging design, 131
Die life
improvement of die life by minimisation of damage accumulation and optimisation of preform design, 608
Die semi-angle
the influence of die semi-angle and of the coefficient of friction on the uniform tensile elongation of drawn copper bars, 388
Die shape
analysis of the effect of die shape on the distribution of mechanical properties and strain field in the tube sinking process, 683
Differential geometry
the use of 'free-flowing' surfaces in tooling design for roll forming, 220
Differential heating
forging of complex geometries with differential heating, 179
Dimensional control
development of an elongation-controlled mill, 351
Distinct element method
inclusion of pressure of liquid phase in three-dimensional distinct element simulation of mushy-state forming, 438
Distortion
finite element analysis of shot peening, 304
DoE
defining the operating window for an automotive sheet pressing operation, 68
Double roller process
thin-strip casting—modelling of the combined casting/metal-forming process, 458
Drawing
computer aided development of a bending–drawing test for thin metallic sheets, 531
influence of strain path in the mechanical properties of drawn aluminum alloy bars, 376
study of cold tube drawing by finite-element modelling, 690
the influence of die semi-angle and of the coefficient of friction on the uniform tensile elongation of drawn copper bars, 388
Drawing stress
back tension value in the fine wire drawing process, 380
Dual-stream function
a study of PSW rolling process using stream functions, 341
Ductile fracture
methodology of preform design considering workability in metal forming by the artificial neural network and Taguchi method, 487
modelling of damage in metal forming processes, 24
Ductile fracture criteria
computationally-experimental workability determination of compressed cylindrical specimen with surface defect, 572
Dynamics
an alternative method between implicit and explicit schemes devoted to frictional contact problems in deep drawing simulation, 257

Earing simulation
influence of initial back stress on the earing prediction of drawn cups for planar anisotropic aluminum sheets, 433
Eccentricity
three-dimensional material flow analysis of asymmetric hollow extrusions, 657

Edge wave
characteristic features of shape defects occurring in the cold roll forming of pre-notched products, 225
Effective strain
analysis of the effect of die shape on the distribution of mechanical properties and strain field in the tube sinking process, 683
Elasticity
evaluation of elasticity and temperature effects on the dimensional accuracy of back-extruded components using finite element simulation, 665
Elastic–plastic
modelling of a roll-forming process with a combined 2D and 3D FEM code, 213
Elastic springback
effect of the training set size on springback control by neural network in an air bending process, 493
Elastic–viscoplastic
dislocation theory based constitutive modelling: foundations and applications, 33
Elasto-plasticity
analysis of metal forming process based on meshless method, 642
identification of material parameters directly from metal forming processes, 560
Electric upsetting
simulation of coupled problem of electric upsetting, 184
Electro-magnetic forming
inside bead forming of aluminum tube by electro-magnetic forming, 695
Elongation
development of an elongation-controlled mill, 351
Elongation-controlled rolling
development of an elongation-controlled mill, 351
Elongation grooves
changes of pass geometry of the system of oval and vertical oval stretching passes in the rolling process, 361
Experiment
experimental study of long product cooling in hot rolling, 337
Experimental design
neural networks for providing 'on-line' access to discretised modelling techniques, 475
Experimental test
computer aided development of a bending–drawing test for thin metallic sheets, 531
Expert system
expert system for hot forging design, 131
Explicit
an overview of numerical modelling techniques, 8
Explicit dynamic analysis
application of explicit FE codes to simulation of sheet and bulk metal forming processes, 620
Explicit FEM
an assessment of numerical parameters influencing springback in explicit finite element analysis of sheet metal forming process, 60
Extreme pressure agents
three selection criteria for the cold metal forming lubricating oils containing extreme pressure agents, 245
Extrusion
constitutive equation development for high strain deformation processing of aluminum alloys, 556
prediction of central bursting in extrusion, 579
some aspects of energy distribution in rotary forming processes, 195
three-dimensional material flow analysis of asymmetric hollow extrusions, 657
Failure
modelling heterogeneous microstructures, inhomogeneous deformation and failure in superplasticity, 96
Failure limit diagrams
computationally-experimental workability determination of compressed cylindrical specimen with surface defect, 572
Fatigue
estimation of tool life in bulk metal forming based on different failure concepts, 602
Feeding effect
an application of ultrasonic vibration to the deep drawing process, 406
FEM
computer aided development of a bending–drawing test for thin metallic sheets, 531
the evaluation of springback in 3D stamping and coining processes, 108
FEM analysis
adaptable tooling sets for metal forming of geometrically similar products, 413
FEM simulation
analysis of the effect of die shape on the distribution of mechanical properties and strain field in the tube sinking process, 683
2D and 3D simulation of complex multistage forging processes by use of adaptive friction coefficient, 298
FE simulation
FE simulations of camber in hot strip rolling, 325
preform design for forging of aerofoil sections using FE simulation, 144
Fine-blanking
experimental study on the shearing behaviour of fine-blanking versus bar cropping, 126
Finite element
a novel method for prediction of rolled cross section shape, 356
an overview of numerical modelling techniques, 8
optimization of metal forming process parameters with damage minimization, 597
prediction of damage evolution in forged aluminium metal matrix composites using a neural network approach, 507
Finite element analysis
a study on optimal design for CONFORM process, 671
development of utility programs for a cold drawing process, 392
effects of the yield criterion on local deformations in numerical simulation of profile forming, 551
finite element analysis of shot peening, 304
finite element modelling of cold forward extrusion using updated Lagrangian and combined Eulerian–Lagrangian formulations, 647
Finite element method
analysis of the cogging process for heavy ingots by finite element method and physical modelling method, 161
finite element analysis of optimum clearance in the blanking process, 121
simulation of multi-step sheet metal forming processes by a static explicit FEM code, 54
Finite-element method
a finite-element simulation of profile ring rolling using a hybrid mesh model, 199
Finite element method
modelling of a roll-forming process with a combined 2D and 3D FEM code, 213
Finite-element method
friction studies at different normal pressures with alternative ring-compression tests, 292
Finite element method
improvement of optimum process design system by numerical simulation, 635

Finite-element method
simplified three-dimensional simulation of rotary piercing of seamless pipe by rigid–plastic finite-element method, 700
Finite-element model
analysis of interfacial slip in cross-wedge rolling: an experimentally verified finite-element model, 273
simulation of coupled problem of electric upsetting, 184
Finite-element modeling
study of cold tube drawing by finite-element modelling, 690
Finite element modelling
neural networks for providing 'on-line' access to discretised modelling techniques, 475
three-dimensional finite element modelling of a titanium aluminide aerofoil forging, 149
Finite elements
biaxial tests on cruciform specimens for the validation of crystallographic yield loci, 545
estimation of tool life in bulk metal forming based on different failure concepts, 602
Finite element simulation
application of explicit FE codes to simulation of sheet and bulk metal forming processes, 620
computationally-experimental workability determination of compressed cylindrical specimen with surface defect, 572
evaluation of elasticity and temperature effects on the dimensional accuracy of back-extruded components using finite element simulation, 665
simulation of a multi-stage railway wheel and tyre forming process, 206
Flash gap
a study on optimal design for CONFORM process, 671
Flexible forging
forging of complex geometries with differential heating, 179
Flexible forming tools
adaptable tooling sets for metal forming of geometrically similar products, 413
Flow curve model
processes of partial bulk metal-forming—aspects of technology and FEM simulation, 174
Flow guide
an experimental study on the nonaxisymmetric square-die extrusion using model material test, 653
Flow stress
modelling on flow stress of Mg–Al–Zn alloys at elevated temperatures, 513
three-dimensional finite element modelling of a titanium aluminide aerofoil forging, 149
FM die
analysis of the cogging process for heavy ingots by finite element method and physical modelling method, 161
Foil
lining of metal plates with foils using hot shot peening, 309
Forging
comparative investigations of interfacial heat transfer behaviour during hot forging and rolling of steel with oxide scale formation, 282
prediction of damage evolution in forged aluminium metal matrix composites using a neural network approach, 507
Forging process
prediction of mechanical properties of heavy forgings, 166
Formability
some problems in steel sheet forming processes, 83
Forming limit
evaluation of the forming limit of aluminum square cups, 427
tube spinnability of AA 2024 and 7075 aluminum alloys, 676
Forward loading simulation
design of a piercing hole in coining process by the three-dimensional backward tracing scheme of the FEM, 113
Fractals
fractal modelling of materials, 565
Fracture
simulation of a multi-stage railway wheel and tyre forming process, 206
Fracture force
evaluation of the forming limit of aluminum square cups, 427
Fracture type
evaluation of the forming limit of aluminum square cups, 427
Friction
a comparison of friction coefficients in cold rolling, 239
an alternative method between implicit and explicit schemes devoted to frictional contact problems in deep drawing simulation, 257
2D and 3D simulation of complex multistage forging processes by use of adaptive friction coefficient, 298
friction studies at different normal pressures with alternative ring-compression tests, 292
monitoring of friction processes by the means of acoustic emission measurements—deep drawing of sheet metal, 263
the influence of die semi-angle and of the coefficient of friction on the uniform tensile elongation of drawn copper bars, 388
Frictional contact
an extension of the radial return algorithm to account for rate-dependent effects in frictional contact and visco-plasticity, 628
Friction coefficient
artificial intelligence identification of process parameters and adaptive control system for deep-drawing process, 421
characterising frictional behaviour in sheet metal forming, 251
three selection criteria for the cold metal forming lubricating oils containing extreme pressure agents, 245
Friction measurement
analysis of the asymmetric upsetting test with extremely high strain rate as tool for friction measurement, 287

Galling
monitoring of friction processes by the means of acoustic emission measurements—deep drawing of sheet metal, 263
Generalized plane-strain modelling
simplified three-dimensional simulation of rotary piercing of seamless pipe by rigid–plastic finite-element method, 700
Genetic algorithm
application of a genetic algorithm to process optimal design in non-isothermal metal forming, 136
Geodesic curvature
the use of 'free-flowing' surfaces in tooling design for roll forming, 220
Globular
an investigation of the mushy state forging process by the finite element method, 444
Grain growth
modelling heterogeneous microstructures, inhomogeneous deformation and failure in superplasticity, 96
Grain modeling
fractal modelling of materials, 565

Hardness measurements
analysis of the effect of die shape on the distribution of mechanical properties and strain field in the tube sinking process, 683
Heat transfer
experimental study of long product cooling in hot rolling, 337

Heavy ingot
analysis of the cogging process for heavy ingots by finite element method and physical modelling method, 161
Helical rolling
modeling the helical rolling of rods in a three-high mill, 365
Hexahedral
2D and 3D simulation of complex multistage forging processes by use of adaptive friction coefficient, 298
Hexahedral element
design of a piercing hole in coining process by the three-dimensional backward tracing scheme of the FEM, 113
High-alloy steels
back tension value in the fine wire drawing process, 380
High-performance computing
steel strip production—a pilot application for coupled simulation with several calculation systems, 330
High strain rate
analysis of the asymmetric upsetting test with extremely high strain rate as tool for friction measurement, 287
Hot deformation
modelling of the influence of thermomechanical processing of Nb-microalloyed steel on the resulting mechanical properties, 524
prediction of mechanical properties of heavy forgings, 166
Hot forging
expert system for hot forging design, 131
simulation of a multi-stage railway wheel and tyre forming process, 206
Hot rolling
experimental study of long product cooling in hot rolling, 337
FE simulations of camber in hot strip rolling, 325
predicting the mean temperature of the transfer bar after rolling in the rougher using a neural network, 469
Hot strip rolling
mathematical modelling of mill set-up in hot strip rolling of high strength steels, 320
Hot working
modelling on flow stress of Mg–Al–Zn alloys at elevated temperatures, 513
Hybrid mesh model
a finite-element simulation of profile ring rolling using a hybrid mesh model, 199

Identification
artificial intelligence identification of process parameters and adaptive control system for deep-drawing process, 421
identification of material parameters directly from metal forming processes, 560
Implicit
an alternative method between implicit and explicit schemes devoted to frictional contact problems in deep drawing simulation, 257
an overview of numerical modelling techniques, 8
Inclined angle
a study of PSW rolling process using stream functions, 341
Incremental metal-forming methods
processes of partial bulk metal-forming—aspects of technology and FEM simulation, 174
Initial back stress
influence of initial back stress on the earing prediction of drawn cups for planar anisotropic aluminum sheets, 433
Interfacial heat transfer coefficient (IHTC)
comparative investigations of interfacial heat transfer behaviour during hot forging and rolling of steel with oxide scale formation, 282
Interfacial slip
analysis of interfacial slip in cross-wedge rolling: an experimentally verified finite-element model, 273
Isothermal forging
three-dimensional finite element modelling of a titanium aluminide aerofoil forging, 149

Large deformation
analysis of metal forming process based on meshless method, 642
an extension of the radial return algorithm to account for rate-dependent effects in frictional contact and visco-plasticity, 628
Large transformations
plastic and viscoplastic damage models with numerical treatment for metal forming processes, 591
Layered tooling sets
adaptable tooling sets for metal forming of geometrically similar products, 413
Limiting drawing ratio
an application of ultrasonic vibration to the deep drawing process, 406
Linear loading path
measurement and analysis of differential work hardening in cold-rolled steel sheet under biaxial tension, 517
Lining
lining of metal plates with foils using hot shot peening, 309
Local deformation
forging of complex geometries with differential heating, 179
Localisation
modelling heterogeneous microstructures, inhomogeneous deformation and failure in superplasticity, 96
Lubricant
monitoring of friction processes by the means of acoustic emission measurements—deep drawing of sheet metal, 263
Lubricating oils
three selection criteria for the cold metal forming lubricating oils containing extreme pressure agents, 245
Lubrication
characterising frictional behaviour in sheet metal forming, 251
friction studies at different normal pressures with alternative ring-compression tests, 292

Magnesium alloy
modelling on flow stress of Mg–Al–Zn alloys at elevated temperatures, 513
Material properties
artificial intelligence identification of process parameters and adaptive control system for deep-drawing process, 421
Mathematical modelling
a study of cross wedge rolling process, 370
mathematical modelling of mill set-up in hot strip rolling of high strength steels, 320
Mathematical programming
improvement of optimum process design system by numerical simulation, 635
Mechanical
an overview of numerical modelling techniques, 8
Mechanical properties
analysis of the effect of die shape on the distribution of mechanical properties and strain field in the tube sinking process, 683
back tension value in the fine wire drawing process, 380
finite element analysis of compression holding step in semi-solid forging and experimental confirmation, 450
influence of strain path in the mechanical properties of drawn aluminum alloy bars, 376

modelling and measurements of mechanical behaviour in multi-pass drawing process, 398
modelling of the influence of thermomechanical processing of Nb-microalloyed steel on the resulting mechanical properties, 524
prediction of mechanical properties of heavy forgings, 166
the influence of die semi-angle and of the coefficient of friction on the uniform tensile elongation of drawn copper bars, 388
using neural network models for predicting mechanical properties after hot plate rolling processes, 481
Mesh generation
surface modelling and mesh generation for simulating superplastic forming, 613
Meshless method
analysis of metal forming process based on meshless method, 642
Mesoscale deformation
fractal modelling of materials, 565
Metal experiments
finite element modelling of cold forward extrusion using updated Lagrangian and combined Eulerian–Lagrangian formulations, 647
Metal flow
three-dimensional material flow analysis of asymmetric hollow extrusions, 657
Metal forming
analysis of metal forming process based on meshless method, 642
application of explicit FE codes to simulation of sheet and bulk metal forming processes, 620
a study of cross wedge rolling process, 370
experimental study on the shearing behaviour of fine-blanking versus bar cropping, 126
identification of material parameters directly from metal forming processes, 560
modelling of damage in metal forming processes, 24
optimization of metal forming process parameters with damage minimization, 597
process and product integration: research challenges, 1
Metal matrix composite
prediction of damage evolution in forged aluminium metal matrix composites using a neural network approach, 507
Microalloyed steel
modelling of the influence of thermomechanical processing of Nb-microalloyed steel on the resulting mechanical properties, 524
Microfracture
deforming and fracture of metals. The model of damageable thermoelastoviscoplastic medium, 585
Microscopic bulge
coining process as a means of controlling surface microgeometry, 101
Microstructure
finite element analysis of compression holding step in semi-solid forging and experimental confirmation, 450
modelling heterogeneous microstructures, inhomogeneous deformation and failure in superplasticity, 96
the effect of microstructural gradients on superplastic forming of Ti–6Al–4V, 90
tube spinnability of AA 2024 and 7075 aluminum alloys, 676
Microstructure modelling
modelling of the influence of thermomechanical processing of Nb-microalloyed steel on the resulting mechanical properties, 524
prediction of mechanical properties of heavy forgings, 166
Microstructure prediction
prediction of damage evolution in forged aluminium metal matrix composites using a neural network approach, 507
Mild-steel
analytical and experimental studies of necking in sheet metal forming processes, 40
Mill set-up
mathematical modelling of mill set-up in hot strip rolling of high strength steels, 320
Modeling
modeling the helical rolling of rods in a three-high mill, 365
Modelling of temperature field in the melt pool
thin-strip casting—modelling of the combined casting/metal-forming process, 458
Monte Carlo methods
generic algorithm for sheet metal working tool selection, using curve matching and tree searching, 501
Multi-pass drawing
modelling and measurements of mechanical behaviour in multi-pass drawing process, 398
Multiphysics
steel strip production—a pilot application for coupled simulation with several calculation systems, 330
Multiplicity
prediction of central bursting in extrusion, 579
Multi-stage slip drawing
back tension value in the fine wire drawing process, 380
Multi-step inverse analysis
three dimensional multi-step inverse analysis for the optimum blank design in sheet metal forming processes, 76
Multi-step processes
simulation of multi-step sheet metal forming processes by a static explicit FEM code, 54
Mushy state
an investigation of the mushy state forging process by the finite element method, 444
Mushy-state forming
inclusion of pressure of liquid phase in three-dimensional distinct element simulation of mushy-state forming, 438

Necking
modelling of damage in metal forming processes, 24
Necking criterion
analytical and experimental studies of necking in sheet metal forming processes, 40
Nett-shape forming
modelling of density and dimensional changes in re-pressing/sizing of sintered components, 188
Neural computing
the role of neural networks in the optimisation of rolling processes, 16
Neural network
2D and 3D simulation of complex multistage forging processes by use of adaptive friction coefficient, 298
Neural networks
neural networks for providing 'on-line' access to discretised modelling techniques, 475
predicting the mean temperature of the transfer bar after rolling in the rougher using a neural network, 469
prediction of damage evolution in forged aluminium metal matrix composites using a neural network approach, 507
Non-isothermal forming
application of a genetic algorithm to process optimal design in non-isothermal metal forming, 136
Non-linear solvers
an alternative method between implicit and explicit schemes devoted to frictional contact problems in deep drawing simulation, 257
Notched specimen
computationally-experimental workability determination of compressed cylindrical specimen with surface defect, 572

Numerical treatment
plastic and viscoplastic damage models with numerical treatment for metal forming processes, 591

Offset angle
a study of PSW rolling process using stream functions, 341
Operating window
defining the operating window for an automotive sheet pressing operation, 68
Optimisation
improvement of die life by minimisation of damage accumulation and optimisation of preform design, 608
Optimization
finite element analysis of optimum clearance in the blanking process, 121
optimization of metal forming process parameters with damage minimization, 597
Optimum blank
three dimensional multi-step inverse analysis for the optimum blank design in sheet metal forming processes, 76
Optimum design
improvement of optimum process design system by numerical simulation, 635
Orthotropic plasticity
the effect of the rheological behaviour and the tribological parameter on sheet metal forming using a new model for orthotropic plasticity, 47
Overall heat transfer coefficient
finite element analysis of compression holding step in semi-solid forging and experimental confirmation, 450
Oxide scale
comparative investigations of interfacial heat transfer behaviour during hot forging and rolling of steel with oxide scale formation, 282

Physical modeling
three-dimensional material flow analysis of asymmetric hollow extrusions, 657
Planar anisotropy
influence of initial back stress on the earing prediction of drawn cups for planar anisotropic aluminum sheets, 433
Plane strain mode
influence of surface texture on orange peel in aluminum, 315
Plastic anisotropy
computer aided development of a bending–drawing test for thin metallic sheets, 531
effects of the yield criterion on local deformations in numerical simulation of profile forming, 551
Plastic deformation
lining of metal plates with foils using hot shot peening, 309
simplified three-dimensional simulation of rotary piercing of seamless pipe by rigid–plastic finite-element method, 700
Plastic instabilities
modelling of damage in metal forming processes, 24
Plastic instability
prediction of central bursting in extrusion, 579
Plasticity
plastic and viscoplastic damage models with numerical treatment for metal forming processes, 591
Powder metallurgy
modelling of density and dimensional changes in re-pressing/sizing of sintered components, 188
Precision forging
preform design for forging of aerofoil sections using FE simulation, 144
Preform design
improvement of die life by minimisation of damage accumulation and optimisation of preform design, 608
methodology of preform design considering workability in metal forming by the artificial neural network and Taguchi method, 487
preform design for forging of aerofoil sections using FE simulation, 144
simulation of a multi-stage railway wheel and tyre forming process, 206
Pre-notch
characteristic features of shape defects occurring in the cold roll forming of pre-notched products, 225
Press forming
improvement of optimum process design system by numerical simulation, 635
Pressure of liquid phase
inclusion of pressure of liquid phase in three-dimensional distinct element simulation of mushy-state forming, 438
Process optimization
application of a genetic algorithm to process optimal design in non-isothermal metal forming, 136
Process parameter
a study on optimal design for CONFORM process, 671
Profile die design
development of utility programs for a cold drawing process, 392
Profiled wire
satellite-mill rolling of U-shaped and H-shaped wires, 345
PSW rolling
a study of PSW rolling process using stream functions, 341

Railway wheels
simulation of a multi-stage railway wheel and tyre forming process, 206
Rapid discretised predictions
neural networks for providing 'on-line' access to discretised modelling techniques, 475
Rapid tooling
adaptable tooling sets for metal forming of geometrically similar products, 413
Rate-dependent friction coefficient
an extension of the radial return algorithm to account for rate-dependent effects in frictional contact and visco-plasticity, 628
Recrystallization
some studies regarding thixoforming of metal alloys, 463
using neural network models for predicting mechanical properties after hot plate rolling processes, 481
Relative density
modelling of density and dimensional changes in re-pressing/sizing of sintered components, 188
Reproducing kernel particle method
analysis of metal forming process based on meshless method, 642
Residual stress
an application of ultrasonic vibration to the deep drawing process, 406
study of cold tube drawing by finite-element modelling, 690
Resonance frequency
an application of ultrasonic vibration to the deep drawing process, 406
Rheological behaviour
the effect of the rheological behaviour and the tribological parameter on sheet metal forming using a new model for orthotropic plasticity, 47
Rigid-plastic finite element analysis
design of a piercing hole in coining process by the three-dimensional backward tracing scheme of the FEM, 113

Ring-compression test
friction studies at different normal pressures with alternative ring-compression tests, 292
Ring-rolling
simulation of a multi-stage railway wheel and tyre forming process, 206
Ring rolling process
a finite-element simulation of profile ring rolling using a hybrid mesh model, 199
Roll-forming
modelling of a roll-forming process with a combined 2D and 3D FEM code, 213
Roll forming
the use of 'free-flowing' surfaces in tooling design for roll forming, 220
Rolling
a comparison of friction coefficients in cold rolling, 239
comparative investigations of interfacial heat transfer behaviour during hot forging and rolling of steel with oxide scale formation, 282
Rolling efficiency
the role of neural networks in the optimisation of rolling processes, 16
Rolling mill
development of an elongation-controlled mill, 351
Roll torque and force
thin-strip casting—modelling of the combined casting/metal-forming process, 458
Rotary forging
some aspects of energy distribution in rotary forming processes, 195
Rotary piercing
simplified three-dimensional simulation of rotary piercing of seamless pipe by rigid–plastic finite-element method, 700

Satellite mill
satellite-mill rolling of U-shaped and H-shaped wires, 345
Secondary yielding
modelling of density and dimensional changes in re-pressing/sizing of sintered components, 188
Section elongation
a novel method for prediction of rolled cross section shape, 356
Section rolling
a novel method for prediction of rolled cross section shape, 356
Selection criteria
three selection criteria for the cold metal forming lubricating oils containing extreme pressure agents, 245
Semi-liquid state
some studies regarding thixoforming of metal alloys, 463
Semi-solid forging
finite element analysis of compression holding step in semi-solid forging and experimental confirmation, 450
Sensitivity
optimization of metal forming process parameters with damage minimization, 597
Sensitivity analysis
identification of material parameters directly from metal forming processes, 560
Separation coefficient
an investigation of the mushy state forging process by the finite element method, 444
Shape defects
characteristic features of shape defects occurring in the cold roll forming of pre-notched products, 225
Shape rolling
changes of pass geometry of the system of oval and vertical oval stretching passes in the rolling process, 361
Shear
experimental study on the shearing behaviour of fine-blanking versus bar cropping, 126
Shearing
finite element analysis of optimum clearance in the blanking process, 121
Shear quality
experimental study on the shearing behaviour of fine-blanking versus bar cropping, 126
Sheet metal
finite element analysis of optimum clearance in the blanking process, 121
generic algorithm for sheet metal working tool selection, using curve matching and tree searching, 501
Sheet metal forming
an assessment of numerical parameters influencing springback in explicit finite element analysis of sheet metal forming process, 60
defining the operating window for an automotive sheet pressing operation, 68
influence of initial back stress on the earing prediction of drawn cups for planar anisotropic aluminum sheets, 433
simulation of multi-step sheet metal forming processes by a static explicit FEM code, 54
Sheet metal forming process
three dimensional multi-step inverse analysis for the optimum blank design in sheet metal forming processes, 76
Sheet stamping
application of explicit FE codes to simulation of sheet and bulk metal forming processes, 620
Shot peening
finite element analysis of shot peening, 304
Shot-peening
lining of metal plates with foils using hot shot peening, 309
Simplified three-dimensional simulation
simplified three-dimensional simulation of rotary piercing of seamless pipe by rigid–plastic finite-element method, 700
Simulation
generic algorithm for sheet metal working tool selection, using curve matching and tree searching, 501
optimization of metal forming process parameters with damage minimization, 597
simulation of coupled problem of electric upsetting, 184
Simulation methods
processes of partial bulk metal-forming—aspects of technology and FEM simulation, 174
Software technology
steel strip production—a pilot application for coupled simulation with several calculation systems, 330
Solid fraction
finite element analysis of compression holding step in semi-solid forging and experimental confirmation, 450
Spin extrusion
processes of partial bulk metal-forming—aspects of technology and FEM simulation, 174
Springback
an assessment of numerical parameters influencing springback in explicit finite element analysis of sheet metal forming process, 60
simulation of multi-step sheet metal forming processes by a static explicit FEM code, 54
the evaluation of springback in 3D stamping and coining processes, 108
Square cup
evaluation of the forming limit of aluminum square cups, 427
Square-die extrusion
an experimental study on the nonaxisymmetric square-die extrusion using model material test, 653

Stainless steel
modelling and measurements of mechanical behaviour in multi-pass drawing process, 398
Steady-state
finite element modelling of cold forward extrusion using updated Lagrangian and combined Eulerian–Lagrangian formulations, 647
Steel
process and product integration: research challenges, 1
thin-strip casting—modelling of the combined casting/metal-forming process, 458
Stick-slip
monitoring of friction processes by the means of acoustic emission measurements—deep drawing of sheet metal, 263
Strain gauges
a comparison of friction coefficients in cold rolling, 239
Strain rate
some problems in steel sheet forming processes, 83
Stretch bending
effects of the yield criterion on local deformations in numerical simulation of profile forming, 551
Stretch forming
surface roughening during uniaxial and equi-biaxial stretching of 70-30 brass sheets, 707
Strip steels
mathematical modelling of mill set-up in hot strip rolling of high strength steels, 320
Strip walk
FE simulations of camber in hot strip rolling, 325
Superplastic forming
process and product integration: research challenges, 1
surface modelling and mesh generation for simulating superplastic forming, 613
Superplasticity
modelling heterogeneous microstructures, inhomogeneous deformation and failure in superplasticity, 96
Surface defects
three selection criteria for the cold metal forming lubricating oils containing extreme pressure agents, 245
Surface deformation
coining process as a means of controlling surface microgeometry, 101
Surface microgeometry
coining process as a means of controlling surface microgeometry, 101
Surface modelling
surface modelling and mesh generation for simulating superplastic forming, 613
the use of 'free-flowing' surfaces in tooling design for roll forming, 220
Surface profile
influence of surface texture on orange peel in aluminum, 315
Surface roughening
surface roughening during uniaxial and equi-biaxial stretching of 70-30 brass sheets, 707
Surface roughness
characterising frictional behaviour in sheet metal forming, 251
influence of surface texture on orange peel in aluminum, 315

Taguchi method
an assessment of numerical parameters influencing springback in explicit finite element analysis of sheet metal forming process, 60
methodology of preform design considering workability in metal forming by the artificial neural network and Taguchi method, 487
Tandem mill
development of an elongation-controlled mill, 351
Taylor–Bishop–Hill models
biaxial tests on cruciform specimens for the validation of crystallographic yield loci, 545
Technology management
process and product integration: research challenges, 1
Technology of shape rolling
changes of pass geometry of the system of oval and vertical oval stretching passes in the rolling process, 361
Temperature
evaluation of elasticity and temperature effects on the dimensional accuracy of back-extruded components using finite element simulation, 665
Temperature prediction
predicting the mean temperature of the transfer bar after rolling in the rougher using a neural network, 469
Temper rolling
the role of neural networks in the optimisation of rolling processes, 16
Tensile tests
calibration of anisotropic yield criteria using uniaxial tension tests and bending tests, 538
Texture
influence of surface texture on orange peel in aluminum, 315
Theoretical-experimental method
modeling the helical rolling of rods in a three-high mill, 365
Thermal calculations
predicting the mean temperature of the transfer bar after rolling in the rougher using a neural network, 469
Thermoelastoviscoplasticity
deforming and fracture of metals. The model of damageable thermoelastoviscoplastic medium, 585
Thermomechanical analysis
application of explicit FE codes to simulation of sheet and bulk metal forming processes, 620
Thermo-mechanical testing
constitutive equation development for high strain deformation processing of aluminum alloys, 556
Thickness
the effect of microstructural gradients on superplastic forming of Ti–6Al–4V, 90
Thin-strip casting
thin-strip casting—modelling of the combined casting/metal-forming process, 458
Thixoforging
some studies regarding thixoforming of metal alloys, 463
Thixoforming
some studies regarding thixoforming of metal alloys, 463
Three-dimensional backward tracing scheme
design of a piercing hole in coining process by the three-dimensional backward tracing scheme of the FEM, 113
Ti–6Al–4V sheet
the effect of microstructural gradients on superplastic forming of Ti–6Al–4V, 90
Time integration
an overview of numerical modelling techniques, 8
Titanium aluminides
three-dimensional finite element modelling of a titanium aluminide aerofoil forging, 149
Tool design
adaptable tooling sets for metal forming of geometrically similar products, 413
Tool life
estimation of tool life in bulk metal forming based on different failure concepts, 602

Tool optimization
adaptable tooling sets for metal forming of geometrically similar products, 413
Tool selection
generic algorithm for sheet metal working tool selection, using curve matching and tree searching, 501
Tree searching
generic algorithm for sheet metal working tool selection, using curve matching and tree searching, 501
Tribological parameter
the effect of the rheological behaviour and the tribological parameter on sheet metal forming using a new model for orthotropic plasticity, 47
Trimming
simulation of multi-step sheet metal forming processes by a static explicit FEM code, 54
Tube
study of cold tube drawing by finite-element modelling, 690
Tube sinking
analysis of the effect of die shape on the distribution of mechanical properties and strain field in the tube sinking process, 683
Tube spinnability
tube spinnability of AA 2024 and 7075 aluminum alloys, 676
Tube spinning
tube spinnability of AA 2024 and 7075 aluminum alloys, 676
Twist
characteristic features of shape defects occurring in the cold roll forming of pre-notched products, 225
Twisting shear deformation
simplified three-dimensional simulation of rotary piercing of seamless pipe by rigid–plastic finite-element method, 700

Ultrasonic oscillation
an application of ultrasonic vibration to the deep drawing process, 406
UMAT
the effect of the rheological behaviour and the tribological parameter on sheet metal forming using a new model for orthotropic plasticity, 47
Upper bound
coining process as a means of controlling surface microgeometry, 101
Upsetting
a study of cross wedge rolling process, 370
inclusion of pressure of liquid phase in three-dimensional distinct element simulation of mushy-state forming, 438
some aspects of energy distribution in rotary forming processes, 195

Variable BHF
artificial intelligence identification of process parameters and adaptive control system for deep-drawing process, 421
Viscoplasticity
plastic and viscoplastic damage models with numerical treatment for metal forming processes, 591
Visco-plasticity
an extension of the radial return algorithm to account for rate-dependent effects in frictional contact and visco-plasticity, 628
Visco-plastic model
an investigation of the mushy state forging process by the finite element method, 444
Volume fraction of solid phase
inclusion of pressure of liquid phase in three-dimensional distinct element simulation of mushy-state forming, 438

Warm forming
cold forging of high strength aluminum alloys and the development of new thermomechanical processing, 156
Wear
monitoring of friction processes by the means of acoustic emission measurements—deep drawing of sheet metal, 263
Wire drawing
back tension value in the fine wire drawing process, 380
Wire rolling
satellite-mill rolling of U-shaped and H-shaped wires, 345
Workability
study of cold tube drawing by finite-element modelling, 690

Yield criteria
calibration of anisotropic yield criteria using uniaxial tension tests and bending tests, 538
measurement and analysis of differential work hardening in cold-rolled steel sheet under biaxial tension, 517

Zener–Hollomon parameter
modelling on flow stress of Mg–Al–Zn alloys at elevated temperatures, 513